Paul G. Domazet
J. W. Hicks, Inc.
20 South Klockner Drive
Knox, Indiana 46534

Re: Registered Construction and Operation Status,
149-11612-00022

Dear Mr. Domazet:

The application from J. W. Hicks, Inc., received on November 29, 1999, has been reviewed. Based on the data submitted and the provisions in 326 IAC 2-5.5, it has been determined that the following non-clay refractory manufacturing source, to be located at 20 South Klockner Drive, Indiana, is classified as registered:

(a) Five (5) natural gas fired space heaters, identified as Reznor V-1, V-2, V-3, V-4, and V-5, with a heat input rate of 0.2 million British thermal units (MMBtu) per hour per heater, exhausting to five (5) stacks identified as V-1, V-2, V-3, V-4, and V-5, respectively.

(b) One (1) natural gas fired drying oven, with three (3) chambers identified as Chamber 1, 2, and 3, with a heat input rate of one (1) MMBtu per hour per chamber, exhausting to three (3) stacks identified as V-7, V-8, and V-9, respectively.

(c) One (1) natural gas fired kiln, with three (3) zones and six (6) burner units per zone, with each burner unit identified as Burner 1 through 18 and a heat input rate of 0.603 MMBtu per hour per burner, exhausting to three (3) stacks identified as S-1, S-2, and S-3.

(d) One (1) natural gas fired kiln after burner with a heat input rate of 0.91 MMBtu per hour, exhausting to one (1) stack, identified as S-2.

(e) One (1) pre-mixer, one (1) mixer, two (2) presses, and one (1) hopper controlled by a dust collector exhausting to one (1) stack, identified as V-6.

(f) One (1) machining center and one (1) band heater.

The following conditions shall be applicable:

1. Pursuant to 326 IAC 5-1-2 (Opacity Limitations) except as provided in 326 IAC 5-1-3 (Temporary Alternative Opacity Limitations), opacity shall meet the following:

    (a) Opacity shall not exceed an average of forty percent (40%) in any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.

    (b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of 15 minutes (60 readings) in a 6-hour period as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuos opacity monitor in a six (6) hour period.

2. Pursuant to 326 IAC 6-3-2 (Process Operations), the particulate matter (PM) from the refractory manufacturing process shall be limited by the following:

   Interpolation and extrapolation of the data for the process weight rate up to sixty thousand (60,000) pounds per hour shall be accomplished by use of the equation:

   $E = 4.10\ P^{0.67}$ where E = rate of emission in pounds per hour; and P = process weight rate in tons per hour

Hopper:	$E = 4.10\ (0.66)^{0.67}$ = 3.1 lb PM/hr
Pre-Mixer:	$E = 4.10\ (0.66)^{0.67}$ = 3.1 lb PM/hr
Mixer:	$E = 4.10\ (1.32)^{0.67}$ = 4.9 lb PM/hr
Nozzle Press:	$E = 4.10\ (1.35)^{0.67}$ = 5.0 lb PM/hr
Plate Press:	$E = 4.10\ (1.35)^{0.67}$ = 5.0 lb PM/hr

   The dust collector shall be in operation at all times the refractory manufacturing process is in operation, in order to comply with 326 IAC 2-5.5. The machining center will not produce PM emissions because the machining is a wet process.

3. Pursuant to 326 IAC 2-5.5, the Permittee shall not allow emissions of particulate matter to exceed twenty-five (25) tons per year. Since the dust collector is considered an integral part of the refractory production process, the potential emissions are determined after the dust collector. In order to comply with 326 IAC 2-5.5, the process cannot operate without the use of the dust collector.

4. The dust collector shall operate at a pressure drop range of 2.0 to 2.5 inches of water and at a minimum actual collection efficiency of 99.97%.

5. Pursuant to 326 IAC 2-5.1-3(e)(2), an inspection shall be performed each calendar quarter of all bags controlling the refractory production operation when venting to the atmosphere. A baghouse inspection shall be performed within three months of redirecting vents to the atmosphere and every three months thereafter. Inspections are optional when venting to the indoors. All defective bags shall be replaced.

6. In the event that a bag failure has been observed, the affected compartments, failed units and refractory production processes that vent to the dust collector shall be shut down immediately until the failed units have been repaired or replaced.

This registration is the first air approval issued to this source. The source may operate according to 326 IAC 2-5.5.

An authorized individual shall provide an annual notice to the Office of Air Management that the source is in operation and in compliance with this registration pursuant to 326 IAC 2-5.5-4(a)(3). The annual notice shall be submitted to: 1/22/99

Compliance Data Section
Office of Air Management
100 North Senate Avenue
P.O. Box 6015
Indianapolis, IN 46206-6015

no later than March 1 of each year, with the annual notice being submitted in the format attached.

An application or notification shall be submitted in accordance with 326 IAC 2 to the Office of Air Management (OAM) if the source proposes to construct new emission units, modify existing emission units, or otherwise modify the source.

Sincerely,

Paul Dubenetzky, Chief
Permits Branch
Office of Air Management

DH

cc: File - Starke County
Starke County Health Department
Air Compliance – Paul Karkiewicz
Northern Regional Office
Permit Tracking - Janet Mobley
Technical Support and Modeling - Michele Boner
Compliance Data Section - Karen Nowak
Office of Enforcement
Air Toxics Program Development Section - Mike Brooks

1/22/99

Registration
Annual Notification

This form should be used to comply with the notification requirements under 326 IAC 2-5.5-4(a)(3).

Company Name:	J. W. Hicks, Inc.
Address:	20 South Klockner Drive
City:	Knox
Authorized individual:	
Phone #:	
Registration #:	149-11612-00022

I hereby certify that J. W. Hicks, Inc. is still in operation and is in compliance with the requirements of Registration 149-11612-00022.

Name (typed):
Title:
Signature:
Date:

Indiana Department of Environmental Management
Office of Air Management

Technical Support Document (TSD) for Registration

Source Background and Description

Source Name: J. W. Hicks, Inc.
Source Location: 20 South Klockner Drive, Knox, IN 46534
County: Starke
SIC Code: 3297
Operation Permit No.: 149-11612-00022
Permit Reviewer: D. Harper

The Office of Air Management (OAM) has reviewed an application from J. W. Hicks, Inc. relating to the construction and operation of a non-clay refractory manufacturer.

Unpermitted Emission Units and Pollution Control Equipment

The source consists of the following unpermitted facilities/units:

(a) Five (5) natural gas fired space heaters, identified as Reznor V-1, V-2, V-3, V-4, and V-5, with a heat input rate of 0.2 million British thermal units (MMBtu) per hour per heater, exhausting to five (5) stacks identified as V-1, V-2, V-3, V-4, and V-5, respectively.

(b) One (1) natural gas fired drying oven, with three (3) chambers identified as Chamber 1, 2, and 3, with a heat input rate of one (1) MMBtu per hour per chamber, exhausting to three (3) stacks identified as V-7, V-8, and V-9, respectively.

(c) One (1) natural gas fired kiln, with three (3) zones and six (6) burner units per zone, with each burner unit identified as Burner 1 through 18 and a heat input rate of 0.603 MMBtu per hour per burner, exhausting to three (3) stacks identified as S-1, S-2, and S-3.

(d) One (1) natural gas fired kiln after burner with a heat input rate of 0.91 MMBtu per hour, exhausting to one (1) stack, identified as S-2.

(e) One (1) pre-mixer, one (1) mixer, two (2) presses, and one (1) hopper controlled by a dust collector exhausting to one (1) stack, identified as V-6.

(f) One (1) machining center and one (1) band heater.

Permitted Emission Units and Pollution Control Equipment

There are no permitted or new emission units and pollution control equipment.

Air Pollution Control Justification as an Integral Part of the Process 1/22/99

The company has submitted the following justification such that the dust collector be considered as an integral part of the refractory production process:

(a) The dust collector is an integral part of the process due to the extreme cost of the material collected. The raw materials used in the refractory production process are a mixture of ceramic and mineral powders and a phenolic resin that is in the liquid and powdered form. This material must be returned to the process prior to pressing so that the product will meet stringent operational parameters.

(b) The materials that are the most susceptible to becoming airborne and require dust collection are those that make up the minor additives that impart the qualities to our product that make its performance superior to the competition. These specific items are also the most costly. Loss of these items in material handling, mixing, and the pressing process would severely compromise our product in the marketplace and increase the cost. It is necessary that the material that becomes airborne in these processes be captured and returned to the mix to prevent the aforementioned problems.

IDEM, OAM has evaluated the justifications and agreed that the dust collector will be considered as an integral part of the refractory production process. Therefore, the permitting level will be determined using the potential to emit after the dust collector. Operating conditions in the proposed permit will specify that this dust collector shall operate at all times when the refractory production process is in operation.

Stack Summary

Stack ID	Operation	Height (feet)	Diameter (feet)	Flow Rate (acfm)	Temperature (^{0}F)
V-1, V-2, V-3, V-4, V-5	Space Heaters	Varies	6”	65	N/A
V-6	Dust Collector	23’-6”	21½“x13 “	3000	Ambient
V-7, V-8, V-9	Drying Oven	14’-11¼“	13½”x9¼”	550	550
S-1, S-2, S-3	1600^{o}C Kiln	30’x11½”	20”	4150	2912
S-2	Kiln Afterburner	30’x11½”	20”	750	1500

Enforcement Issue

(a) IDEM is aware that equipment has been constructed and operated prior to receipt of the proper permit. The subject equipment is listed in this Technical Support Document under the condition entitled *Unpermitted Emission Units and Pollution Control Equipment.*

(b) IDEM is reviewing this matter and will take appropriate action. This proposed permit is intended to satisfy the requirements of the construction permit rules.

Recommendation

The staff recommends to the Commissioner that the construction and operation be approved. This recommendation is based on the following facts and conditions:

Unless otherwise stated, information used in this review was derived from the application and additional information submitted by the applicant.

An application for the purposes of this review was received on November 29, 1999, with additional

information received on May 9, 2000. **1/22/99**

Emission Calculations

See Appendix A of this document for detailed emissions calculations. (2 pages)

Potential To Emit

Pursuant to 326 IAC 2-1.1-1(16), Potential to Emit is defined as Athe maximum capacity of a stationary source or emissions unit to emit any air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of a source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or type or amount of material combusted, stored, or processed shall be treated as part of its design if the limitation is enforceable by the U. S. EPA, the department, or the appropriate local air pollution control agency.@

Pollutant	Potential To Emit (tons/year)
PM	0.54
PM-10	0.5
SO_2	0.0
VOC	14.8
CO	5.8
NO_x	6.9

HAPs	Potential To Emit (tons/year)
ethylene glycol	4.32
formaldehyde	4.06
phenol	0.96
TOTAL	9.34

(a) The potential to emit of VOC is greater than or equal to 10 tons per year. Therefore, pursuant to 326 IAC 2-1, a registration is required.

(b) Fugitive Emissions
Since this type of operation is not one of the twenty-eight (28) listed source categories under 326 IAC 2-2 and since there are no applicable New Source Performance Standards that were in effect on August 7, 1980, the fugitive particulate matter (PM) and volatile organic compound (VOC) emissions are not counted toward determination of PSD and Emission Offset applicability.

Actual Emissions

No previous emission data has been received from the source.

County Attainment Status

The source is located in Starke County.

Pollutant	Status
PM-10	attainment
SO_2	attainment
NO_2	attainment
Ozone	attainment
CO	attainment
Lead	attainment

1/22/99

(a) Volatile organic compounds (VOC) and oxides of nitrogen (NOx) are precursors for the formation of ozone. Therefore, VOC emissions are considered when evaluating the rule applicability relating to the ozone standards. Starke County has been designated as attainment or unclassifiable for ozone. Therefore, VOC and NOx emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 and 40 CFR 52.21.

(b) Starke County has been classified as attainment or unclassifiable for all pollutants. Therefore, these emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 and 40 CFR 52.21.

(c) Fugitive Emissions
Since this type of operation is not one of the 28 listed source categories under 326 IAC 2-2, 40 CFR 52.21, or 326 IAC 2-3 and since there are no applicable New Source Performance Standards that were in effect on August 7, 1980, the fugitive particulate matter (PM) and volatile organic compound (VOC) emissions are not counted toward determination of PSD and Emission Offset applicability.

Source Status

This new source is not a major stationary source because no attainment pollutant is emitted at a rate of 250 tons per year or greater and it is not in one of the 28 listed source categories. Therefore, pursuant to 326 IAC 2-2, and 40 CFR 52.21, the PSD requirements do not apply.

Part 70 Permit Determination

326 IAC 2-7 (Part 70 Permit Program)

This new source is not subject to the Part 70 Permit requirements because the potential to emit (PTE) of:
(a) each criteria pollutant is less than 100 tons per year,
(b) a single hazardous air pollutant (HAP) is less than 10 tons per year, and
(c) any combination of HAPs is less than 25 tons/year.

This is the first air approval issued to this source.

Federal Rule Applicability

(a) There are no New Source Performance Standards (NSPS)(326 IAC 12 and 40 CFR Part 60) applicable to this source.

(b) There are no National Emission Standards for Hazardous Air Pollutants (NESHAPs)(326 IAC 14 and 40 CFR art 63) applicable to this source.

State Rule Applicability - Entire Source

326 IAC 5-1 (Opacity Limitations)

Pursuant to 326 IAC 5-1-2 (Opacity Limitations), except as provided in 326 IAC 5-1-3 (Temporary Alternative Opacity Limitations), opacity shall meet the following, unless otherwise stated in this permit:

(a) Opacity shall not exceed an average of forty percent (40%) any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.

(b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings) as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a

continuous opacity monitor) in a six (6) hour period.

1/22/99

State Rule Applicability - Individual Facilities

326 IAC 6-3-2 (Process Operations)

The particulate matter (PM) from the refractory manufacturing process shall be limited by the following:

Interpolation and extrapolation of the data for the process weight rate up to sixty thousand (60,000) pounds per hour shall be accomplished by use of the equation:

$E = 4.10\ P^{0.67}$ where E = rate of emission in pounds per hour; and P = process weight rate in tons per hour

Hopper:	$E = 4.10\ (0.66)^{0.67}$ = 3.1 lb PM/hr
Pre-Mixer:	$E = 4.10\ (0.66)^{0.67}$ = 3.1 lb PM/hr
Mixer:	$E = 4.10\ (1.32)^{0.67}$ = 4.9 lb PM/hr
Nozzle Press:	$E = 4.10\ (1.35)^{0.67}$ = 5.0 lb PM/hr
Plate Press:	$E = 4.10\ (1.35)^{0.67}$ = 5.0 lb PM/hr

The dust collector shall be in operation at all times the refractory manufacturing process is in operation, in order to comply with 326 IAC 2-5.5. The machining center will not produce PM emissions because the machining is a wet process.

Air Toxic Emissions

Indiana presently requests applicants to provide information on emissions of the 188 hazardous air pollutants (HAPs) set out in the Clean Air Act Amendments of 1990. These pollutants are either carcinogenic or otherwise considered toxic and are commonly used by industries. They are listed as air toxics on the Office of Air Management (OAM) Construction Permit Application Form Y.

(a) This source will emit levels of air toxics less than those which constitute a major source according to Section 112 of the 1990 Clean Air Act Amendments.

(b) See attached calculations for detailed air toxic calculations. (Appendix A, page 2)

Conclusion

The construction and operation of this refractory manufacturing process shall be subject to the conditions of the attached Registration 149-11612-00022.

Appendix A: Emissions Calculations
Natural Gas Combustion Only
MM BTU/HR <100
Small Industrial Boiler

Company Name: J. W. Hicks, Inc.
Address City IN Zip: 20 South Klockner Drive, Knox, IN 46534
CP: 149-11612
Plt ID: 149-00022
Reviewer: D. Harper
Date: 7/25/00

Heat Input Capacity MMBtu/hr	Potential Throughput MMCF/yr
15.8	138.5

	Pollutant					
	PM*	PM10*	SO2	NOx	VOC	CO
Emission Factor in lb/MMCF	1.9	7.6	0.6	100.0 **see below	5.5	84.0
Potential Emission in tons/yr	0.1	0.5	0.0	6.9	0.4	5.8

*PM emission factor is filterable PM only. PM10 emission factor is condensable and filterable PM10 combined.
**Emission Factors for NOx: Uncontrolled = 100, Low NOx Burner = 50, Low NOx Burners/Flue gas recirculation = 32

Methodology

All emission factors are based on normal firing.
MMBtu = 1,000,000 Btu
MMCF = 1,000,000 Cubic Feet of Gas

Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,000 MMBtu
Emission Factors are from AP 42, Chapter 1.4, Tables 1.4-1, 1.4-2, 1.4-3, SCC #1-02-006-02, 1-01-006-02, 1-03-006-02, and 1-03-006-03 (SUPPLEMENT D 3/98)
Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton
Note: Check the applicable rules and test methods for PM and PM10 when using the above emission factors to confirm that the correct factor is used (i.e., condensable included/not included).

Appendix A: Emissions Calculations
Natural Gas Combustion Only
MM BTU/HR <100
Small Industrial Boiler
HAPs Emissions

Company Name:
Address City IN Zip:
CP:
Plt ID:
Reviewer:
Date:

HAPs - Organics

	Benzene	Dichlorobenzene	Formaldehyde	Hexane	Toluene
Emission Factor in lb/MMcf	2.1E-03	1.2E-03	7.5E-02	1.8E+00	3.4E-03
Potential Emission in tons/yr	1.454E-04	8.310E-05	5.194E-03	1.246E-01	2.354E-04

HAPs - Metals

	Lead	Cadmium	Chromium	Manganese	Nickel
Emission Factor in lb/MMcf	5.0E-04	1.1E-03	1.4E-03	3.8E-04	2.1E-03
Potential Emission in tons/yr	3.462E-05	7.617E-05	9.695E-05	2.631E-05	1.454E-04

Methodology is the same as page 1.

The five highest organic and metal HAPs emission factors are provided above.
Additional HAPs emission factors are available in AP-42, Chapter 1.4.

Appendix A: Emission Calculations
Company Name: J. W. Hicks, Inc.
Source Address: 20 South Klockner Drive, Knox, IN 46534
CP: 149-11612
Plt ID: 149-00022
Reviewer: D. Harper
Date: 07/26/00

Potential to Emit* (PTE) from Refractory Manufacturing Process

mass flow rate of particulate matter (PM) to dust collector: 31.5 lb/hr
efficiency of dust collector: 99.97%
mass flow rate of PM after dust collector: (31.5 lb/hr) x (1 - 0.9997) = 0.00945 lb/hr
PTE of PM after dust collector = (0.00945 lb/hr) x (8760 hr/yr) x (1 ton/2000 lb)
= **0.04 ton PM/yr**

*the dust collector is an integral part of the process, therefore PTE is calculated after controls

PTE from 1600^{o}C Kiln

(0.988 lb ethylene glycol/hour) x (8760 hour/year) x (1 ton/2000 lb) = 4.32 ton ethylene glycol/yr
(0.928 lb formaldehyde/hour) x (8760 hour/year) x (1 ton/2000 lb) = 4.06 ton formaldehyde/yr
(0.219 lb phenol/hour) x (8760 hour/year) x (1 ton/2000 lb) = 0.96 ton phenol/yr
(1.105 lb phenolic resin/hour) x (8760 hour/year) x (1 ton/2000 lb) = 4.84 ton phenolic resin/yr
(0.009 lb ammonia/hour) x (8760 hour/year) x (1 ton/2000 lb) = 0.04 ton ammonia/yr
(0.039 lb hexamethylenetetramine/hour) x (8760 hour/year) x (1 ton/2000 lb) = 0.17 ton hexa./yr

PTE for Hazardous Air Pollutants (HAPs)
PTE = (4.32 ton ethylene glycol/yr) + (4.06 ton formaldehyde/yr) + (0.96 ton phenol/yr)
= **9.34 ton HAP/yr**

PTE for Volatile Organic Compounds (VOCs)
PTE = (4.32 ton ethylene glycol/yr) + (4.06 ton formaldehyde/yr) + (0.96 ton phenol/yr) +
(4.84 ton phenolic resin/yr) + (0.17 ton hexamethlenetetramine/yr)
= **14.4 ton VOC/yr**